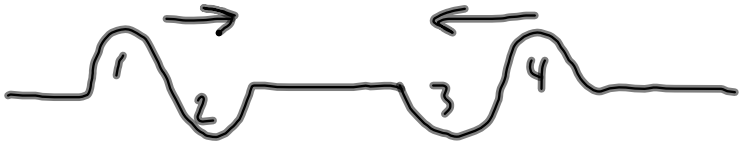
1)



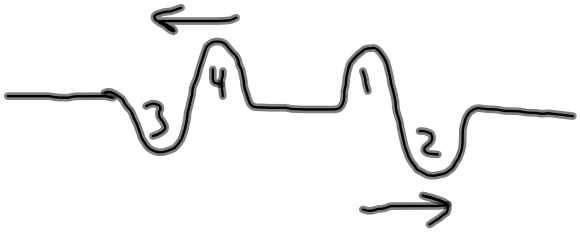
assume wave pulse amplitudes and widths are equal

2)

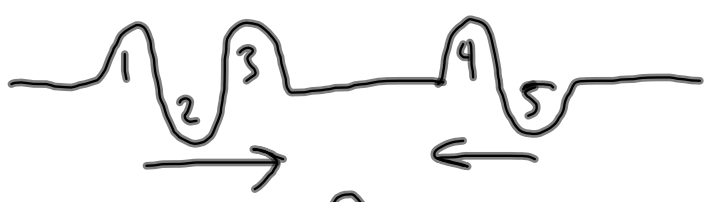
3)

4)

5)

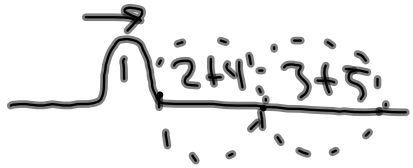


1)



2)

3)



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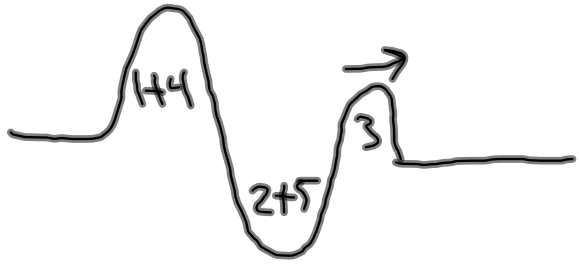

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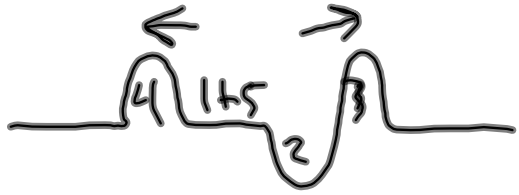
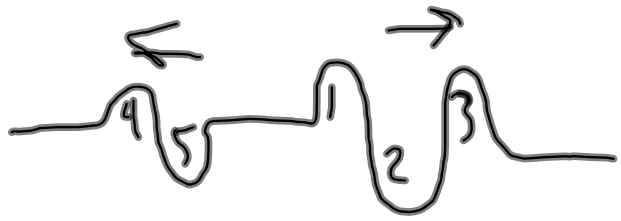
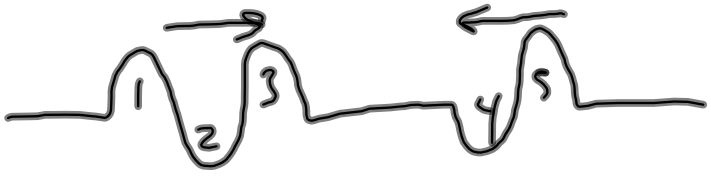


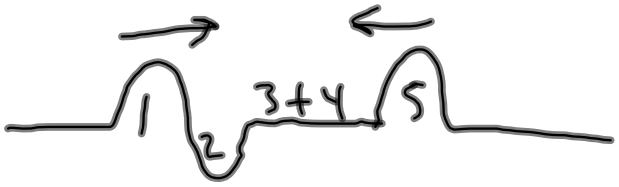
6)



1)



2)



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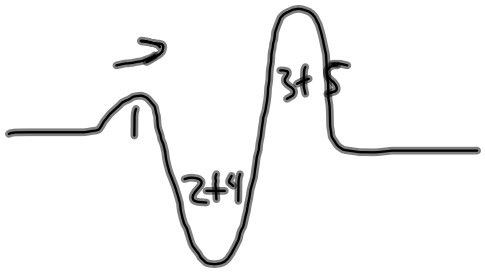
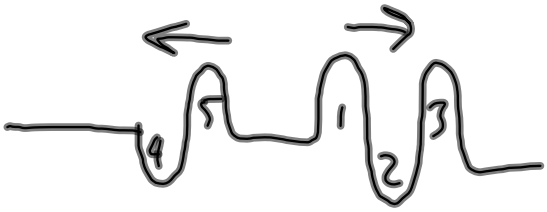


4)

5)

6)

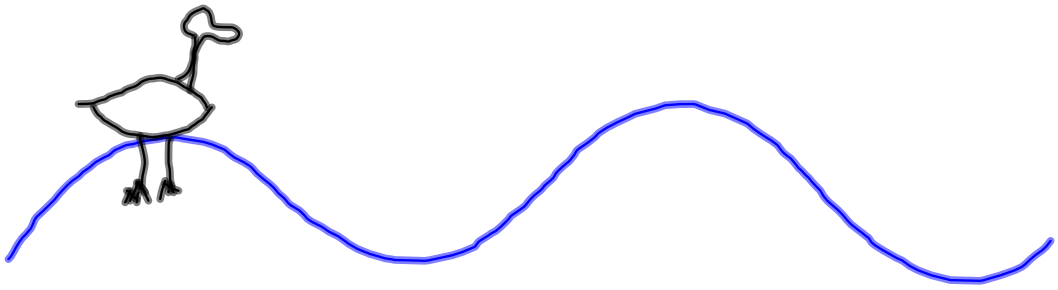


The piano string tuned to middle C vibrates with a frequency of 264 Hz. Assuming the speed of sound in air is 343 m/s, find the wavelength of the sound waves produced by the string.

$$v = \lambda f$$

$$\lambda = \frac{v}{f} = \frac{343 \text{ m/s}}{264 \text{ 1/s}} = 1.3 \text{ m}$$

As waves pass by a duck floating on a lake, the duck bobs up and down but remains essentially in one place. Explain why the duck is not carried along by the wave motion.



A wave of amplitude of 0.30 m interferes with a second wave of amplitude 0.20 m. What is the largest resultant displacement that may occur? What is the smallest resultant displacement that may occur?

Largest: Constructive

$.3\ m + .2\ m = .5\ m$

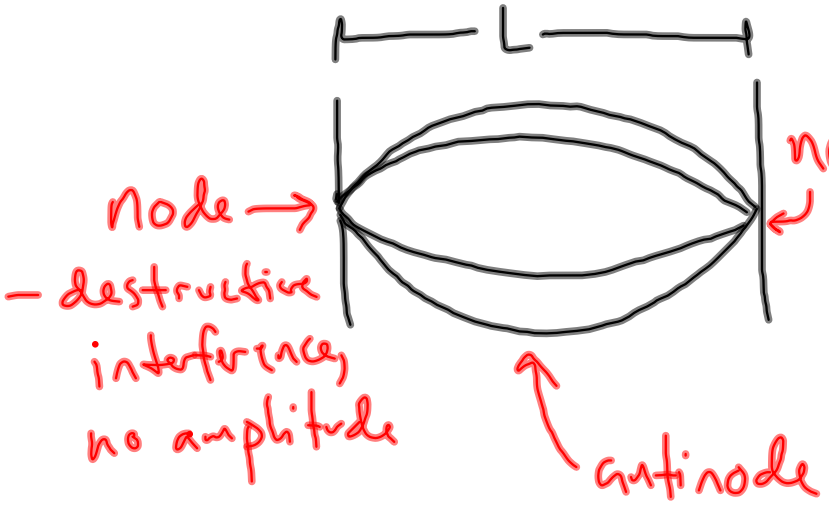
Smallest: Destructive

$.3\ m - .2\ m = .1\ m$

Reflections at a Boundary:

- Fixed end
  - Destructive interference
  - Wave pulse changes directions
    - (up → down or down → up)
- Free end
  - Constructive interference
  - Wave pulse stays in same direction

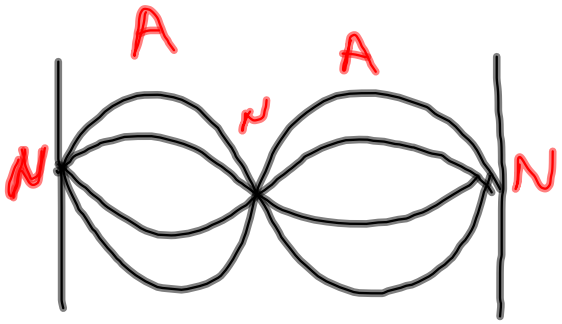
Standing Waves:



fundamental frequency

f_1

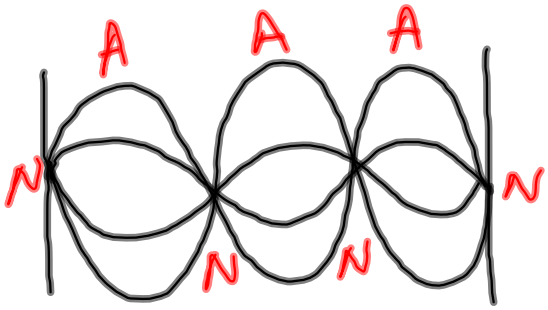
$\lambda_1 = 2L$



2nd order frequency

$f_2 = 2f_1$

$\lambda_2 = L$



3rd order frequency

$f_3 = 3f_1$

$\lambda_3 = \frac{2}{3}L$

HW:

p. 387: 1, 2, 4

Quiz Friday on Waves